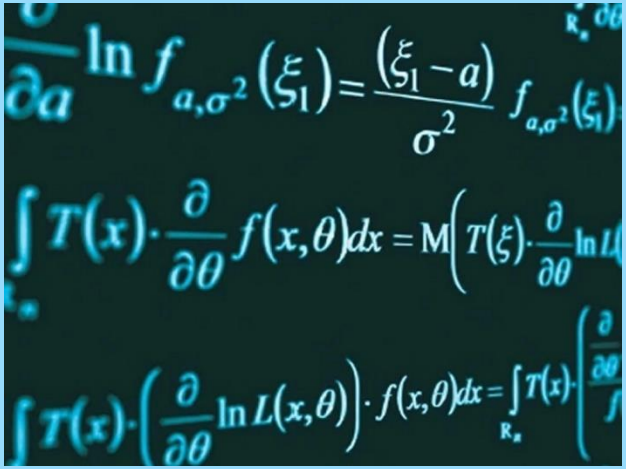
2019

Curriculum Skills and Progression Mathematics



Nebula
where stars are born

The Nebula Federation

Frettenham Primary School

SKILLS MAP
Mathematics – EYFS

Expected ELG

Number

- Select the correct numeral to represent 1 to 5, then 1 to 10
- objects
- Count objects to 10, then 20 (with 1:1 recognition)
- Recognise and order numbers to 10, then 20
- Estimate how many objects they can see and check by counting
- Use the language of 'more' and 'fewer' to compare sets of objects
- Find one more or one less from a group of objects (to 5, then 10)
- Say which number is one more or one less than a given number
- In practical activities and discussion, begin to use the vocabulary involved in adding and subtracting.
- Use objects and practical methods to add and subtract two single digit numbers, counting on or back to find the answer
- Record, using marks that they can interpret and explain
- Begin to identify own mathematical problems based on own interests and fascinations
- Solve problems involving doubling, halving and sharing

Shape, Space and Measures

- Begin to use mathematical names for 'solid' 3D shapes and 'flat' 2D shapes and mathematical terms to describe them
- Explore the characteristics of everyday shapes and use mathematical language to describe them
- Compare and order two or three items by length/height, weight or capacity
- Use everyday language related to time when sequencing events
- Begin to use everyday language related to money
- Describe their relative position such as 'behind' or 'next to'
- Recognise, create and describe patterns

Exceeding ELG

Number

Pupils can…

- Estimate a number of objects and check quantities by counting up to 20
- Solve practical problems that involve combining groups of 2, 5 or 10, or sharing into equal groups

Shape, Space and Measures

Pupils can…

- Make estimates
- Measure objects using non-standard units
- Compare and weigh objects using a balance
- Compare and order objects by their length/ height; weight and capacity
- Talk about the properties of 2D and 3D shapes
- Describe the position of a person or object
- Talk about time and the sequence of events using mathematical language

Key Vocabulary

Number and place	Measure	Geometry (position	Geometry	Fractions	Data/statistics	General/problem

value		and direction)	(properties of shape)			solving
Zero 1-20 Teen numbers Eleven, twelve None Count..on/ back/ up Same as Ones, tens, digit, More Fewest, fewer Larger, largest Less, least Biggest greatest Order First, second, third… Last Before, after, next between Guess How many? Add more and Make, sum, total Altogether Double One more…. How many more… Take away How many left…	Measure Compare Estimate Just…. About the same… Metre Length, width, height, depth Long, Short, Tall High , low Wide, narrow Thick, thin Weigh, balance, lighter, heavier, Scales Full, empty, holds Container, Days of the week Day, week Morning, afternoon, evening, night Birthday Today, yesterday, tomorrow, quicker slower older, younger, newer, hour minute clock, time money, pounds, pence, coins, price,	Over, under Above, below, Top bottom side On in, outside, inside, around, in front, behind, Front, back, next to, opposite Between Left, right, up , down forwards, backwards.	Shape, pattern, Flat, curved, straight, round, hollow, solid, sort, make, build, draw, size, symmetrical Repeat, match Corner, side Rectangle, circle, triangle. Face, edge, cube, pyramid Sphere, cone	Parts of a whole Half quarter	Count sort, group, set, list	Pattern, puzzle, What could we try? Recognise Describe Compare

One less… Difference between Share, double, halve.	cost, buy sell, spend, pay.					

SKILLS MAP
Mathematics – Year 1

Expected	Greater Depth
Pupils can … • Count to and across 100 forwards and backwards, beginning with 0 or 1, or from any given number • Count, read and write numbers to 100 in numerals • Count, read and write numbers to 20 in words • Count in multiples of twos, fives and tens • Identify and represent numbers using objects and pictorial representations, including the number line • Begin to use the language of equal to, more than, less than, most and least • Represent (including symbols) and use number bonds and related subtraction facts within 20 • Add and subtract 1-digit and 2-digit numbers to 20, including 0 • Read, write and interpret mathematical statements involving addition, subtraction and equals signs • Solve missing number problems • Solve one-step problems involving multiplication and division, by using concrete objects, pictorial representations and arrays • Recognise, find and name a half as one of two equal parts of an object, shape or quantity • Begin to recognise, find and name a quarter of one of four equal parts • Recognise and know the value of different denominations of coins and notes • Describe position, direction and movement including whole, half, quarter and 3 quarter turns • Compare, describe and solve practical problems for:	**Pupils can …** • Count reliably well beyond 100 • Count on and back in 3s from any given number to beyond 100 • Say the number that is 10 more or 10 less than a number to 100 • Know the symbols (+); (-); (=); (<); (>) • Apply my knowledge of number to solve a one-step problem involving an addition, a subtraction and simple multiplication and division • Add and subtract 1-digit and 2-digit numbers to 50, including zero • Work in a systematic, logical way to find patterns, generalise and justify mathematical thinking • Reason about addition using the correct mathematical language *A pupil can explain that when you add 0 to a number the number does not change. A pupil can explain if 2 numbers added together will total more or less than 10* • Recognise patterns in the number system. For example, when counting in 10s from 0 the answer will always end in 0; when counting in 5s from 0, the number will end in 0 or 5; when they count in 2s from 0, the answer will always be even • Can recognise and explain when a group of objects can be shared equally and when it cannot • Can identify which of a selection of o'clock and half past times will occur next • Recognise all coins and notes and know their value • Use coins to pay for items bought up to £1 • Use my knowledge of time to know when key periods of the day happen, for example, lunchtime, home time, etc. • Can arrange 4 containers of different sizes according to mass, or capacity

○ Lengths and heights (long/short, double/half) ○ Mass/weight (heavy/light) ○ Capacity and volume (full/empty) ○ Time (quicker, slower, earlier, later, before, after, next, first, today, yesterday, tomorrow, morning, afternoon, evening) • Recognise and use language relating to dates including days of the week, weeks, months and years • Tell the time to the hour and half past the hour and draw the hands on a clock face to show these times • Recognise and name common 2D and 3D shapes • Describe position, direction and movement, including half, quarter and three-quarter turns	• Can spot 2D shapes in the faces of 3D shapes.

Key Vocabulary

Number and place value	Measure	Geometry (position and direction)	Geometry (properties of shape)	Fractions	Data/statistics	General/problem solving
Numeral Numbers to 100 Forwards, backwards Equal to Most least Many Multiple of… Halfway between Roughly Addition Near double Subtract Missing number Multiplication Multiply Division	Measurement Roughly Centimetre Ruler Metre stick Kilogram Half kilogram Litre Half litre Capacity Volume Quarter full Months of the year Seasons Earlier Later Half past, quarter	Underneath Centre Quarter turn, three quarter turn.	Symmetry Symmetrical pattern Point Cuboid, cylinder, Vertex, vertices.		Vote, table	How long will it be…? How long will it take…? How often? Always, sometimes, never, often. Mentally,

Dividing Group Array Fraction Equal part Equal sharing quarter	past, hour hand, minute hand, hours minutes. Change, cheaper, total.					

SKILLS MAP Mathematics – Year 2	
Expected	**Greater Depth**

Pupils can …
• Count in steps of 2, 3 and 5 from 0, and in tens from any number, forward and backward
• Read and write numbers to at least 100 in numerals and in words
• Compare and order numbers from 0 to 100, using < > + signs
• Recognise the place value of each digit in a 2-digit number
• Partition two-digit numbers into different combinations of tens and ones. This may include using apparatus (e.g. 23 is the same as 2 tens and 3 ones which is the same as 1 ten and 13 ones)
• Recall and use addition and subtraction facts to 20 fluently, and derive and use related facts up to 100
• Add and subtract mentally, including:
  ○ A 2-digit number and ones
  ○ A 2-digit number and tens
  ○ Two 2-digit numbers
  ○ Adding three 1-digit numbers
• Add and subtract 2 two-digit numbers within 100 and can demonstrate and explain their method using concrete apparatus or pictorial representations
• Recognise and use the inverse relationship between addition and subtraction and use this to check calculations
	Pupils can …
	• Work in a systematic, logical way to find patterns, generalise and justify mathematical thinking
	• Read scales in divisions of ones, twos, fives and tens in a practical situation where not all numbers on the scale are given and estimate points in between
	• Use multiplication facts to make deductions outside known multiplication facts (e.g. a pupil knows that multiples of 5 have one digit of 0 or 5 and uses this to reason that 18 × 5 cannot be 92 as it is not a multiple of 5)
	• Use reasoning about numbers and relationships to solve more complex problems and explain their thinking. E.g. solve more complex missing number problems (e.g. 14 + – 3 = 17; 14 + Δ = 15 + 27)
	• Solve unfamiliar word problems that involve more than one step (e.g. which has the most biscuits, 4 packets of biscuits with 5 in each packet or 3 packets of biscuits with 10 in each packet?)
	• Read and draw on hands to show the time on the clock to the nearest 5 minutes
	• Describe similarities and differences of shape properties (e.g. finds 2

• Recall and use multiplication and division facts for the 2, 5 and 10 multiplication tables to solve simple problems, demonstrating an understanding of commutativity as necessary • Identify 1/3, 1/4, 1/2, 2/4, 3/4 of a length, shape, set of objects or quantity and knows that all parts must be equal parts of the whole • Use different coins to make the same amount • Read and draw hands on the time on the clock to the nearest 15 minutes • Compare and sort 2D and 3D shapes, using mathematical language to describe their properties • Describe position, direction and movement • Read scales in divisions of ones, twos, fives and tens • Interpret and construct simple pictograms, tally charts, block diagrams and table	different 2-D shapes that only have one line of symmetry; that a cube and a cuboid have the same number of edges, faces and vertices but can describe what is different about them)

Key Vocabulary

Number and place value	Measure	Geometry (position and direction)	Geometry (properties of shape)	Fractions	Data/statistics	General/problem solving
Numbers to one thousand. Hundreds Partition, recombine Greater than , less than..< > 3 digit number Place value Groups of Times Share equally Row, column	Quarter past/to m/km, g/kg, ml/l Temperature (degrees) Digital / analogue Seconds Furthest	Rotation Clockwise, anticlockwise Straight line Ninety-degree turn, right angle	Surface Symmetrical, line of symmetry Fold Mirror line, reflection Pattern, repeating pattern Rectangular, circular,	Three quarters, one third, a third Equivalence, equivalent Numerator Denominator Mixed number	Count, tally, sort Graph, block graph, pictogram, Represent Group, set, list, table Label, title Most popular, most common, least popular, least common	Predict Describe the pattern, describe the rule Find, find all, find different Investigate

SKILLS MAP Mathematics – Year 3	
Expected	**Greater Depth**
Pupils can … • Compare and order numbers up to 1000 • Read and write numbers up to 1000 in numerals and words • Count in multiples of 4, 8, 50 and 100 • Find 10 or 100 more or less than a given number • Recognise the place value of each digit in a three digit number (hundreds, tens, ones) • Solve number problems including missing number problems and practical problems involving place value • Add and subtract numbers mentally, including: a 3 digit number and ones, a 3 digit number and tens, a 3 digit number and hundreds • Add and subtract numbers with up to 3 digits using formal written methods of column addition and subtraction – see school calculation policy • Estimate the answer to a calculation and use the inverse to check • Solve problems including missing number problems using number facts, place value and more complex addition and subtraction • Recall and use multiplication and division facts for the 3, 4 and 8 times tables • Write and calculate mathematical statements for multiplication and division using the multiplication tables that they know, including for two digit numbers times one digit numbers, using mental and progressing to formal written methods	**Pupils can …** • Work in a systematic, logical way to find patterns, generalise and justify mathematical thinking • Reason and represent place value in different ways using mathematical language • Partition a 3-digit number and use that to work out its compliment to 1000, explaining their reasoning using the language of place value • Calculate mentally using efficient strategies • Solve missing numbers problems such as 384 = 171 + ? • Use formal methods to solve problems, including multi-step and apply skills to create own multi-step problems using mathematical language: • Solve problems such as ‘A fish weighs 50g, another fish weighs 8 times as much, how much does the larger fish weigh?’ • Solve problems such as, ‘Dad drives a truck. Last week he drove 267 miles on Monday, 186 on Tuesday and 198 on Wednesday. This week Dad drove 282 miles in total. What is the difference in mileage between this week and last week.’ • Recognise relationships between fractions and decimals and express them as equivalent quantities - Jimmy has 6 marbles. This is 0.4 or 2/5s of the total number. What is the total number of marbles

• Solve problems, including missing number problems, involving multiplication and division, including integer scaling problems and correspondence problems in which n objects and connected to m objects. • Count up and down in tenths: recognise that tenths arise from dividing an object into 10 equal parts and in dividing one-digit numbers or quantities by 10 • Recognise, find and write fractions of a discrete set of objects: unit fractions and non-unit fractions with small denominators • Recognise and show, using diagrams, equivalent fractions with small denominators • Compare and order unit fractions and fractions with the same denominators • Add and subtract fractions and solve problems using fractions with the same denominator within one whole • Measure, compare, add and subtract: lengths (m/cm/mm): mass (kg/g) volume/capacity (l/ml) including • measure the perimeter of simple 2D shapes • Add and subtract amounts of money to give change using both £ and p in practical contexts • Tell and write the time from an analogue clock, including using Roman numerals from 1 to X11 and 12 hour and 24 hour clocks • Know the number of seconds in a minute • Record and compare time in respect to seconds, minutes and hours • Know the number of days in a month, the number of months in a year and the number of days in a year – including a leap year • Identify right angles • Recognise that two right angles make a half-turn, three make three quarters of a turn and four a complete turn • identify whether angles are greater than or less than a right angle • Recognise that angles are a property of a shape or a description of a right angle • Identify horizontal and vertical lines and pairs of perpendicular and parallel lines • Draw 2D shapes using mathematical language • Recognise 2D and 3D shapes in different positions and orientation and describe them	• Calculate using fractions and decimals • Calculate 2/4 + 3/4 = 5/4 and 5/4 – 3/4 = 2/4. They realise that 5/4 is greater than one and can suggest ways to record this • Calculate with measures (time, capacity, length, mass) - 6 toy cars balance 2 dolls. 4 dolls balance 1 toy robot. If the robot weighs 3 kg, what does each toy car weigh? • Use mathematical reasoning to compare angles - Can you draw a quadrilateral with: 1 right angle? 2 right angles? 5 right *angles? No right angles?* Can you draw a triangle with 1 right angle? 2 Right angles? Are some of these are impossible, can you explain why?

• Make 3d shapes using different modelling materials • Interpret and present data using bar charts, pictograms and tables • Solve one step and 2 step questions using information presented in scales bar charts and pictograms and tables	

Key Vocabulary

Number and place value	Addition and subtraction	Multiplication and division	Measure	Geometry (position and direction)	Geometry (properties of shape)	Fractions	Data/statistics
Approximately	Column addition and subtraction	Product Multiples of four, eight, fifty and one hundred Scale up	Leap year Century Twelve-hour/twenty-four- hour clock Roman numerals I to XII Millimetre perimeter	Greater/less than ninety degrees Orientation (same orientation, different orientation) Compass points Horizontal, vertical, diagonal, Angle , right angle Acute /obtuse.	Horizontal, vertical, perpendicular and parallel lines Pentagon, hexagon, octagon, quadrilateral Prism hemisphere	Numerator, denominator Unit fraction, non-unit fraction Compare and order Tenths	Chart, bar chart, frequency table, Carroll diagram, Venn diagram Axis, axes Diagram Chart

SKILLS MAP

Mathematics – Year 4	
Expected	**Greater Depth**
Pupils can … • Count in multiples of 6, 7, 9, 25 and 1000 • Count backwards through zero to include negative numbers • Order and compare numbers beyond 1000, including up to 2 decimal places • Find a 1000 more or less than a given number • Recognise the place value of each digit in a four digit whole number • Round any number to the nearest 10, 100 or 1000 • Read roman numerals up to 100 • Identify, represent and estimate numbers using different representations • Solve problems that involve number, place value, estimation and rounding • Add and subtract numbers up to 4 digit using formal written methods – see school calculation policy • Solve addition and subtraction two step problems in contexts, deciding which operations and methods to use and why • Recall multiplication and division facts of multiplication tables up to 12 x 12 • Multiply 2 and 3 digit numbers by 1 digit number using a formal written layout – see school calculation policy • Estimate and use inverse operations to check answers in a calculation • Recognise and use factor pairs and commutativity in mental calculations • Use place value, known and derived facts to multiply and divide mentally including multiplying by 1 and zero and dividing by 1; multiplying together 3 numbers • solve problems involving multiplying and adding, including using the distributive law to multiply two digit numbers by one digit, integer scaling problems and harder correspondence problems such as n objects are connected to m objects. • Recognise and show, using diagrams (e.g fraction walls), common equivalent fractions • Add and subtract fractions within the same denominator • recognise and write decimal equivalents to ¼ ½ ¾	**Pupils can …** • Work in a systematic, logical way to find patterns, generalise and justify mathematical thinking. • Reason about place value: *How many different ways can you write 5510. Pupils suggest ways such as 551 tens, 55 hundreds and 1 ten 5510 ones* • *Arrange the digit cards 1 4 5 and 8 to make the number closest to 6000 and can justify their choice using the language of place value.* • Calculate mentally using efficient strategies: *Write 3 calculations in which you would use mental calculation strategies and 3 where you would apply a column method and explain the decision you made with each calculation Can work out 345 x 6 mentally by calculating 300 x is 1800 40 x 6 is 240 and 5 x 6 is 30 to get 2070* • Apply formal methods to solve multi-step problems: *Sarah buys 5 pens at £1.25 each, 3 pencils at 38p each and a ruler for 85p. How much change does she get from £10?* • Recognise relationships between fractions and decimals and express them as equivalent quantities: *Can you order these decimals and fractions on a number line? 0.35 3/4 0.5 1/5 4/9* • Calculate using fractions and decimals: *A soup recipe uses 3/4 as many onions as carrots. Jo is making the soup and has 8 carrots. How many onions does Jo use? Explain how you worked out the number of onions? Did you use the same method each time?* • Substitute values into a simple formula to solve problems: *3 x a + 2 = 17 What is the value of a?* • Calculate with measures (time, capacity, length, mass): *Converting and ordering across a range of measures* • Use mathematical reasoning to compare and order angles • Compare angles in order to decide whether a polygon is regular

• Can find fractions of a given quantity • Count up and down in hundredths: recognise that hundredths arise when dividing an object by one hundred and dividing tenths by ten, including representing as a decimal • recognise and write decimal equivalents of any number of tenths or hundredths • find the effect of dividing a one- or two-digit number by 10 and 100, identifying the value of the digits in the answer as ones, tenths and hundredths • compare numbers with the same number of decimal places up to two decimal places • Round decimals with one decimal place to the nearest whole number • Solve simple measure and money problems involving fractions and decimals to two decimal places, including formal column method where appropriate • Estimate, compare and calculate different measures, including money in pounds and pence • Convert between different units of measure (kilometre to metre: hour to minute) • Solve problems involving converting time between analogue and digit 12 and 24 hour clocks • Compare and classify geometric shapes, using the language of orientation, including quadrilaterals and triangles, based on their properties and sizes, including Identifying acute, obtuse angles and right angles • Measure and calculate the perimeter and area of rectilinear shapes – including squares in m and cm • find the area of rectilinear shapes by counting squares • Identify lines of symmetry in 2D shapes presented in different orientations • Plot specified points and draw sides to complete a given polygon • Describe and plot positions on 2D grids as co-ordinates, including describing movements as translation • Solve comparison, sum and difference problems using information presented in bar charts, pictograms, tables and other graphs • interpret and present discrete and continuous data using appropriate	

graphical methods, including bar charts and time graphs	

Key Vocabulary

Number and place value	Multiplication and division	Measure	Geometry (position and direction)	Geometry (properties of shape)	Fractions	Data/statistics
Tenths, hundredths Decimal (places) Round (to nearest) Thousand more/less than Positive Negative integers Count through zero – minus Consecutive Roman numerals (I to C)	Multiplication facts (up to 12x12) Division facts Inverse Derive	Convert Metric unit Area, Cm 2	Coordinates Translation Quadrant x-axis, y-axis Perimeter and area	Equalerial/ isosceles / scalene triangle. Heptagon, parrellogram, rhombus, trapezium, polygon Spherical	Equivalent decimals and fractions proportion	Continuous data Line graph Arrive, depart

SKILLS MAP

Mathematics – Year 5	
Expected	**Greater Depth**
Pupils can … • Read, write, order and compare numbers to at least 1000000 and determine the value of each digit, including up to 3 decimal places • Round any number up to 1000000 to the nearest 10, 100, 100, 10,000 and 100,000, including rounding to the nearest whole number and one decimal place • Interpret negative numbers in context • Count forwards and backwards with positive and negative whole numbers, including through zero • Count forwards or backwards in steps of powers of 10 for any given number up to 1 000 000 • Read Roman numerals to 1000 (M) and recognise years written in Roman numerals. • Add and subtract whole numbers with more than 4 digits, including using formal written methods (columnar addition and subtraction) – solve multi-step problems • Add and subtract whole numbers with more than 4 digits mentally • Solve problems involving multiples and factors, including finding all factor pairs of a number, and common factors of two numbers. Including prime numbers to 100 and composite numbers • Recognise and use squared numbers and cube numbers and the notation for squared and cubed • Solve problems involving multiplication and division, including scaling by simple fractions and problems involving simple rates (See calculation policy) • Multiple and divide whole numbers and those involving decimals by 10, 100 and 1000 • multiply numbers up to 4 digits by a one- or two-digit number using a formal written method, including long multiplication for two-digit numbers • Use rounding to check answers to calculations • Multiply and divide numbers mentally drawing upon known facts • Divide numbers up to 4 digits by a one-digit number using the formal	**Pupils can …** • Work in a systematic, logical way to find patterns, generalise and justify mathematical thinking • Reason and represent place value in different ways using mathematical language: *Pupils can work the connection between finding the difference between negative numbers and subtracting them* • Calculate mentally using efficient strategies: *Pupils can write a variety of calculations derived from 15 + 63 = 78 and generalize to describe further calculations 20x 7 x 5 = 20 x 5 x 7 = 100 x 7 = 700* • Use formal methods to solve problems, including multi-step: *Sam and Tom have £67.80 between them. If Sam has £6.20 more than Tom, how much does Tom have?* • Solve problems between fractions and decimals and percentages and express them as equivalent quantities: *Jack and Jill each go out shopping. Jack spends ¼ of his money. Jill spends 20% of her money. Frank says Jack spent more because ¼ is greater than 20%. Alice says you cannot tell who spent more. Who do you agree with, Frank or Alice? Explain why?* • Use the numbers 3 4 5 and 6 makes this sum have the smallest possible answer: *I spent 3/5s of my money and had £1.40 left to buy lunch. How much money did I have to begin with?* • Substitute values into a simple formula to solve problems • Find the perimeter of a rectangle or the area of a triangle: *A rectangle has a perimeter of 20. What is the largest possible area it could have?* • Calculate with measures (time, capacity, length, mass) - *True or false? 1.5kg + 600 g = 2.1kg + 300g 32 cm + 1.05m = 150 cm – 0.13 m 3/4 L + 0.05 L = half of 1.6 L Explain your reasoning* • Apply angle properties in different contexts • Construct a triangle with angles of 48 degrees 60 degrees and 72 degrees and draw any rectilinear shape, with given dimensions, to the nearest millimetre

written method of short division and interpret remainders appropriately for the context • Solve problems involving addition, subtraction, multiplication and division and a combination of these, including understanding the meaning of the equals sign Compare and order fractions whose denominators are all multiples of the same number • Read and write decimal numbers as fractions • compare and order fractions whose denominators are all multiples of the same number • Identify, name and write equivalent fractions of a given fraction, represented visually, including tenths and hundredths • recognise and use thousandths and relate them to tenths, hundredths and decimal equivalents • Round decimals with two decimal places to the nearest whole number and to one decimal place • Read, write, order and compare numbers with up to three decimal places • Solve problems involving number up to three decimal places • Recognise the per cent symbol (%) and understand that per cent relates to 'number of parts per hundred', and write percentages as a fraction with denominator 100, and as a decimal • Read, write, order and compare numbers with up to three decimal places • Solve problems which require knowing percentage and decimal equivalents of a half, quarter, a fifth, two fifths and four fifths and those fractions with a denominator of a multiple of 10 or 25 • Recognise mixed numbers and improper fractions and convert them from one form to the other and write mathematical statements > 1 as a mixed number • Add and subtract fractions with the same denominators and with denominators with the same multiples • Multiply proper fractions and mixed numbers by whole numbers • Convert between different units of metric measure (k/m) (cm/ml) (g/kg) (l/ml) • Solve problems involving converting between different units of time • Measure and calculate the perimeter of composite rectilinear shapes in centimetres and metres • Calculate and compare the area of rectangles (including squares) and	

including using standard units, square cm and square m and estimate the area of irregular shapes • Estimate and identify the volume • Use all four operations to solve problems involving money using decimal notation, including scaling • Understand and use approximate equivalences between metric units and common imperial units • Know angles are measured in degrees. Draw given angles and measure them in degrees • Estimate and compare acute, obtuse and reflex angles • Distinguish between regular and irregular polygons based on reasoning about equal sides and angles, including finding missing lengths and angles • Identify angles at a point, straight line and half a turn • Identify other multiples of 90 degrees • Identify and describe and represent the position of shapes after reflection and translation • Identify 3D shapes from 2D representations • Complete, read and interpret information in tables, including timetables • Solve comparison, sum and difference problems using information presented in a line graph	

Key Vocabulary

Number and place value	Addition and subtraction	Multiplication and division	Measure	Geometry (position and direction)	Geometry (properties of shape)	Fractions, decimals and percentages
Powers of 10 Thousandths,	Efficient written method	Factor pairs Composite numbers, prime number, prime factors, square number, cubed number	Volume Imperial units, pint gallon, metric units Square mm Square m	Reflex angle Dimensions X axis Y axis Reflective symmetry Quadrant	Regular and irregular Polygons	Proper fractions, improper fractions, mixed numbers Percentage Half, quarter, fifth, two fifths, four fifths

			Formal written method		coordinate		Ratio, proportion

SKILLS MAP Mathematics – Year 6	
Expected	**Greater Depth**
Pupils can … • Demonstrate an understanding of place value, including large numbers (up to 10 000 000) and decimals (e.g. what is the value of the '7' in 276,541?;) • Read, write, order and compare numbers up to 10 000 000 • Round any whole numbers to a given degree of accuracy • Use negative numbers in context including calculating intervals across zero • Solve number problems and practical problems involving place value, negative numbers and rounding • multiply multi-digit numbers up to 4 digits by a two-digit whole number using the formal written method of long multiplication • Divide numbers up to 4 digits by a two-digit whole number using the formal written method of long division, and interpret remainders as whole number remainders, fractions, or by rounding, as appropriate for the context	**Pupils can …** • Work in a systematic, logical way to find patterns, generalise and justify mathematical thinking • Have sufficient depth of knowledge and understanding to reason and explain mathematical concepts and procedures and use them to solve a variety of problems, using mathematical language

• Divide numbers up to 4 digits by a two-digit number using the formal written method of short division where appropriate, interpreting remainders according to the context • Perform mental calculations including mixed operations and large numbers, using efficient strategies such as manipulating expressions using commutative and distributive properties to simplify the calculation *(e.g. 53 – 82 + 47 = 53 + 47 – 82 = 100 – 82 = 18; 20 × 7 × 5 = 20 × 5 × 7 = 100 × 7 = 700; 53 ÷ 7 + 3 ÷ 7 = (53 +3) ÷ 7 = 56 ÷ 7 = 8)* • Use formal methods to solve multi-step problems *(e.g. find the change from £20 for three items that cost £1.24, £7.92 and £2.55; a roll of material is 6m long: how much is left when 5 pieces of 1.15m are cut from the roll?; a bottle of drink is 1.5 litres, how many cups of 175ml can be filled from the bottle, and how much drink is left?) Follow calculation policy* • Identify common factors, common multiples and prime numbers • Use their knowledge of the order of operations to carry out calculations involving the four operations • Solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why • Solve problems involving addition, subtraction, multiplication and division • Use estimation to check answers to calculations and determine, in the context of a problem, an appropriate degree of accuracy. • Use common factors to simplify fractions; use common multiples to express fractions in the same denomination • Compare and order fractions, including fractions > 1 • Add and subtract fractions with different denominators and mixed numbers, using the concept of equivalent fractions • Multiply simple pairs of proper fractions, writing the answer in its simplest form [for example, 4 1 × 2 1 = 8 1] • Divide proper fractions by whole numbers [for example, 3 1 ÷ 2 = 6	

1] • Associate a fraction with division and calculate decimal fraction equivalents [for example, 0.375] for a simple fraction [for example, 8 3] • Identify the value of each digit in numbers given to three decimal places and multiply and divide numbers by 10, 100 and 1000 giving answers up to three decimal places • Multiply one-digit numbers with up to two decimal places by whole numbers • Use written division methods in cases where the answer has up to two decimal places • Solve problems which require answers to be rounded to specified degrees of accuracy • Recall and use equivalences between simple fractions, decimals and percentages, including in different contexts • Express a remainder as a decimal or fraction • Substitute values into a simple formula to solve problems *(e.g. perimeter of a rectangle or area of a triangle).* • Generate and describe linear number sequences • Express missing number problems algebraically • Find pairs of numbers that satisfies an equations with 2 unknown • Enumerate possibilities of combinations of 2 variables • Solve problems involving the relative sizes of two quantities where missing values can be found by using integer multiplication and division facts • Solve problems involving ratio and scale factor • Solve problems involving the calculation of percentages [for example, of measures, and such as 15% of 360] and the use of percentages for comparison • Solve problems involving similar shapes where the scale factor is known or can be found • Solve problems involving unequal sharing and grouping using	

knowledge of fractions and multiples • Solve problems involving the calculation and conversion of units of measure, using decimals up to three decimal places • Use, read, write and convert between standard units, converting measurements of length, mass, volume and time from a smaller unit of measure to a larger unit, and vice versa, using decimal notation to up to three decimal places • Convert between miles and kilometres • Recognise that shapes with the same areas can have different perimeters and vice versa • Recognise when it is possible to use formulae for area and volume of shapes • Calculate the area of parallelograms and triangles • Calculate, estimate and compare volume of cubes and cuboids using standard units, including cubic centimetres (cm3) and cubic metres (m3), and extending to other units [for example, mm3 and km3]. • draw 2-D shapes using given dimensions and angles • Recognise, describe and build simple 3-D shapes, including making nets • Compare and classify geometric shapes based on their properties and sizes • Find unknown angles in any triangles, quadrilaterals, and regular polygons • Illustrate and name parts of circles, including radius, diameter and circumference and know that the diameter is twice the radius • Recognise angles where they meet at a point, are on a straight line, or are vertically opposite, and find missing angles. • describe positions on the full coordinate grid (all four quadrants) • Draw and translate simple shapes on the coordinate plane, and reflect them in the axes. • Interpret and construct pie charts and line graphs and use these to	

solve problems • Calculate and interpret the mean as an average.	

Key Vocabulary

Number and place value	Addition and subtraction	Multiplication and division	Geometry (position and direction)	Geometry (properties of shape)	Fractions, decimals and percentages	Algebra	Data/statistics
Numbers to ten million	Order of operations	Order of operations Factorise Digit total Common factors, common multiples Ratio proportion	Four quadrants (for coordinates)	Vertically opposite (angles) Circumference, radius, diameter Intersecting, net,	Degree of accuracy Simplify	Linear number sequence Substitute Variables Symbol Known values Unknown variable Formula equation	Mean Pie chart Construct